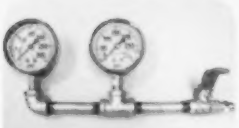

CropPest Ontario

Agriculture Development Branch
Editor—Albert Tenuta– Field Crop Pathologist
www.omafra.gov.on.ca/croppest

ISSN 1203-2204 VOLUME NO. 17 ISSUE NO. 06 July 24 2012

"IN THIS ISSUE"

- Using Corn Damaged by Dry Weather for Silage
- Soil Management Workshop—August 2, 2012
- Gauge your coverage, How to Assemble your own Pressure Gauge Tester
- SWCDD 2012—Great Success

Comments, suggestions or articles are welcome. To be added to the distribution list please contact:

Albert Tenuta or Mirjam Hall
Phone 519-674-1690
Fax 519-674-1564
albert.tenuta@ontario.ca or mirjam.hall@ontario.ca

Using Corn Damaged By Dry Weather For Silage

Joel Bagg, Forage Specialist, OMAFRA, Lindsay

Dry weather during corn silking and pollination can significantly reduce grain yield expectations. Inadequate moisture can result in poor ear fill or even corn plants without any ear or grain. In extended dry weather situations, farmers can also face the immediate problem of providing adequate forage inventories to feed their livestock. Damaged corn crops with low grain yield potential may be available for salvaging as corn silage for livestock producers that are short of forage. Silage piles and silage bags provide flexible storage. Farmers attempting to salvage corn fields damaged by dry weather by harvesting them as forage should be aware of some of the harvesting and nutrition implications.

Evaluate Yield Potential

Tremendous variation can occur in corn fields stressed by lack of rain. Development of the ears is critical to grain and silage yield, and also silage quality. Some fields may have short plant height with fairly normal ears. Yields will be reduced, but forage quality will be close to normal. Other fields will be more normal in height but have very small ears or no ears. Grain yields will be dramatically reduced, but there may still be some potential to provide some forage for livestock.

PIONEER A DuPont Company
Hyland BUILDING
NK syngenta
Bayer CropScience
FS
MONSANTO imi ine
BASF The Chemical Company

Ministry of Agriculture, Food and Rural Affairs
Ontario

Using Corn Damaged By Dry Weather For Silage

Joel Bagg, Forage Specialist, OMAFRA, Lindsay

Inspect corn fields to evaluate yield potential. If pollination has occurred, there will be small, white blisters visible a week to 10 days after pollination. Detecting successful pollination without waiting for the kernel blisters to appear, can be done by carefully removing the husks, turning the ear upside down and gently tapping it. The majority of silks should fall off indicating successful pollination. Silks that remain attached indicate kernels that have not been pollinated. Contact Agricorp at 1-888-247-4999 to determine how using this corn as silage will impact a Crop Insurance claim. Check herbicide labels to ensure adequate days to harvest.

Figure 1. Dry weather stressed corn

Digestible Energy Levels

Digestible energy levels of corn silage without any grain content are reduced. Quality will likely be inadequate for high producing dairy cows or feedlot animals. In areas with low forage yields and a need for emergency feed, quality may be adequate for livestock with low to moderate energy requirements.

Starch content will be reduced, but there is likely a higher level of soluble sugars. Crude protein may be slightly higher. Fibre levels will be higher, and the lignin content can also be increased. Because 45 percent of the energy in normal corn silage comes from the starch fraction, the relative energy value of corn with no ears may be as low as 65 to 85 percent of well-eared corn silage. In the rumen, the residual sugars will be more rapidly available than starch.

Feeds should be sampled and analyzed, rations should be balanced and a nutritionist consulted. Energy predictions of Total Digestible Nutrients (TDN) using Acid Detergent Fibre (ADF) and Neutral Detergent Fibre (NDF) will not be very accurate. Analyzing for

OMAFRA Field Crop Staff Working for You!

Dawn Pate	Manager–Field Crops	519-826-3257
Joel Bagg	Forage Specialist	705-324-5856
Scott Banks	Emerging Crops Specialist	613-258-8359
Tom Cowan	Entomology, Field Crops Program Lead (A)	519-674-1696
Horst Bohner	Soybean Specialist	519-271-5858
Christine Brown	Nutrient Management Field Crop Program Lead	519-537-8305
Mike Cowbrough	Weed Management Field Crops Program Lead	519-824-4120 ext.52580
Brian Hall	Edible Beans & Canola Specialist	519-271-0083
Peter Johnson	Cereals Specialist	519-271-8180
Adam Hayes	Soil Management Specialist–Field Crops	519-674-1621
Ian McDonald	Applied Research Coordinator-Field Crops	519-824-4120 ext 56707
Gilles Quesnel	IPM Program Lead-Field Crops (Bilingual)	613-258-8250
Greg Stewart	Corn Industry Program Lead	519-824-4120 ext 54865
Albert Tenuta	Pathologist – Field Crops Program Lead	519-674-1617

starch, NDF and NDF digestibility will give much better estimates of digestible energy than fibre alone. Wet chemistry analysis rather than near infrared spectroscopy (NIRS) should be used.

Harvest At Correct Moisture

Ensiling at the correct whole plant moisture is critical. Without a normal cob, it can be difficult to correctly estimate whole plant moisture from visual clues. Corn silage damaged by dry weather conditions tends to look drier than it actually is. Harvesting at moistures that are too low will result in poor packing, inadequate air exclusion, poor fermentation and greater spoilage. Harvesting at moisture levels above 70 percent will result in seepage and a very undesirable clostridia fermentation. This silage will have high levels of foul smelling butyric acid, with poor feed quality and palatability. (Silage Fermentation Problems www.omafra.gov.on.ca/english/crops/field/news/croptalk/2010/ct-0910a6.htm)

Recommended moisture contents for corn silage are as follows:
Horizontal bunker silos: **65 – 70 %**
Bag silos: **60 – 68 %**
Upright concrete stave silos: **62 – 67 %**
("Harvesting Corn Silage At The Right Moisture" http://www.omafra.gov.on.ca/english/crops/facts/07-047.htm)

It is very difficult to accurately estimate the moisture of earless corn silage without measuring it. There are no milk-lines to use as guides. Leaves may look dry, but the stalk will contain more moisture. A common problem is harvesting corn silage from these damaged fields too soon, resulting in run-off and a poor fermentation. If you are in doubt about the whole-plant moisture, chop a sample using a harvester or yard chipper. Use a Koster Tester, microwave or laboratory to determine percent dry matter. Sample at least 10 plants from the field, avoiding the headlands. Watch for moisture variability within fields.

Be aware that samples have residual moisture that is not removed when dried with a Koster Tester or microwave without burning it. Dry matter determined by oven drying at a laboratory is the most accurate. (This can be done by using overnight courier service.) Koster Testers and microwaves typically under estimate moisture by about 3 %. A 68 % moisture sample reading is actually about 71 % (too wet). If using a Koster or microwave, taking the time to carefully dry the sample is important. The finer that the sample is chopped, the easier is will be to dry, and the more accurate the result.

Nitrate Poisoning

Be aware of the potential for nitrate poisoning, as well as silo gas. Nitrates accumulate in the corn plants when there is a large amount of soil nitrates, and a lack of moisture that interferes with normal plant growth. Nitrate accumulation is often greatest following a rain that ends a dry period. Following rainfall, the conversion of nitrates to plant protein resumes and nitrate levels return to more normal levels in a few days. Wait at least 5 to 7 days following a rainfall before harvesting. Weeds such as lambsquarters and pigweed can also be high nitrate accumulators. Long, sustained dry periods are less likely than brief, intense dry periods to accumulate high nitrate levels.

The bottom third of the stalk contains a much higher level of nitrates. If nitrates are a potential concern, the cutter bar could be raised to leave more of the stalk in the field, but this will also further reduce yields in a year when feed is needed. Analyzing fermented silage samples for nitrates and managing dietary levels is recommended. A few other considerations to manage high nitrate potential include:

- **Fermentation Reduces Nitrates**

Nitrates can be reduced 25 – 65 percent during a proper silage fermentation. Typical reductions are in the 40 percent range. Allow at least 3 – 5 weeks of fermentation before feeding. Corn silage that is harvested too wet or too dry will not ferment properly and dissipate the nitrates. The addition of non-protein nitrogen (NPN), such as urea or anhydrous ammonia, to this corn silage is not recommended.

Using Corn Damaged By Dry Weather For Silage

...continued

- **Don't Graze Or Green Chop**

Green chopping or grazing corn stressed by dry weather should be avoided due to the potential of high nitrate levels and poisoning. Green chop that is not fed immediately undergoes respiration that converts nitrate to nitrite, so the risk is increased.

- **Nitrate Toxicity Symptoms**

In the rumen, nitrates are normally converted to nitrites, which are converted to ammonia and then amino acids. High levels of nitrites are absorbed in the blood and tie up hemoglobin so that it cannot transport oxygen. Symptoms of nitrate toxicity include a rapid pulse, difficult breathing, muscle tremors and weakness. A blue mucous membrane may develop. Animals typically go down and die suddenly, within 3 hours of the initial symptoms. If you suspect nitrate poisoning, keep the animals quiet and comfortable and call your veterinarian immediately. Subacute or chronic poisoning can cause reproductive problems, including abortion.

- **Nitrate Analysis**

Testing at harvest will provide a general idea of the relative nitrate levels, but not the concentration of nitrates in the silage being fed. The best time to test for nitrate concentration is after fermentation is complete. Obtain a representative sample. Keep the samples refrigerated and send to the lab as quickly as possible. If high levels are reported, water and other feeds should also be tested.

- **Feeding Management**

As a general rule, nitrate ion (NO3) levels should be less than 0.44%, or 1,000 ppm nitrate-nitrogen to be without risk. Levels greater than 1.76 % NO3, or 4,000 ppm nitrate-nitrogen should not be fed. Feeding forages with nitrate content between these levels is associated with risks relative to the amount fed and the type of livestock. Careful management is required. Young, nursing and pregnant animals are higher risk. Introduce higher nitrate feeds slowly. Adequate energy in the rumen assists the nitrate to ammonia conversion, which reduces the potential for poisoning. Adequate levels of nonstructural carbohydrates (NSC) should also be fed.

- **Silo Gas**

The increased nitrate potential increases the risk of silo gas. Nitrogen dioxide, NO2, is a dangerous chemical asphyxiant and is produced almost immediately after plant material is placed into a silo. Even short-term human exposure can result in severely injured lung tissue and sudden death. It has a characteristic bleach-like odour and may be visible as a reddish-brown haze. It is heavier than air, therefore it will tend to be located just above the silage surface. It may also flow down silo chutes and into feed rooms. Use the silo gas precautions and procedures outlined in "Hazardous Gases" (OMAFRA Factsheet #04-087) at www.omafra.gov.on.ca/english/engineer/facts/04-087.pdf. Refer to the Ontario Farm Safety Association at http://www.farmsafety.ca/public/factsheets/silo_gas_dangers.pdf.

Corn damaged by extended dry weather conditions can be used as corn silage to supplement forage needs, but extra care is required in ration balancing, harvesting at the correct moisture, and managing the nitrate and silo gas risks. Information on harvest and storage of corn silage, including "Pricing Corn Silage", "Silage Fermentation Problems", and "Grazing Corn Stover" is available on the OMAFRA Crop Website at http://www.omafra.gov.on.ca/english/crops/field/forages.html.

SOIL MANAGEMENT WORKSHOP

"From field to 300 bushel yield"

Thursday, August 2, 2012
Dunnville Area, Haldimand–Norfolk
8:45 a.m. - 3:30 p.m.

Registration and further details, please contact Woodstock OMAFRA Office at 519-537-6621

Registration deadline has been extended to Friday, July 27th

Gauge your Coverage
How to Assemble your Own Pressure Gauge Tester

Carly Decker, OMAFRA, Simcoe

Many farmers have never changed or tested their sprayer pressure gauge(s). This makes assessing sprayer performance and output difficult. Sprayer performance has a direct impact on coverage, efficacy and may affect subsequent yield.

The direct impact of a faulty gauge is that you may be spraying more or less product than you intended. More product means wasted money and less product may mean compromised spray coverage.

A few clear indications that your pressure gauge is near retirement:

- Opaque or unreadable face
- Mineral oil leaking
- Needle does not rest on zero pin when sprayer is not under pressure
- Needle bounces during operation (this may also indicate the surge suppression chamber on the sprayer is low on air)

Sometimes a gauge is not obviously in need of replacement. Suspecting an issue, some growers will simply go out and buy a new gauge. However, even brand new gauges can be inaccurate right off the shelf. In order to test any gauge you need to apply a known pressure to see if it is reading accurately.

One method is to put two gauges in series on the same sprayer to see if they are in agreement. This is not always possible depending on your make of sprayer.

Figure 1. The Pressure Gauge Tester

At a recent sprayer workshop, one grower had a great suggestion for testing gauges. His pressure gauge tester concept is designed to hook up to your farm air compressor (see Figure 1). It allows you to test your suspect gauge against a known working gauge. How do you know if your known gauge is accurate? Buy a few, test them against each other using this tester, keep one that you know to be accurate and return the rest.

The following is a list of parts that you will need to build the pressure gauge tester.

Parts list

Part	Price	Source
2 x ¼" by 3" Galvanized nipples	**$2.69 ea**	**TSC**
¼" Galvanized 90° elbow	**$3.19**	**TSC**
¼" Galvanized Tee	**$3.19**	**TSC**
¼" Ball valve (threaded)	**$8.19**	**TSC**
***Plug Air Connector (A over ¼")**	**$2.99**	**TSC**
Teflon pipe tape	**$0.89**	**TSC**
†300 psi liquid-filled gauge	**$17.80**	**Hal-nor Tractor Supplies**

*Depending on the air connector on your compressor
†Test gauge range should match your existing gauge. Sprayer gauges should have double the normal spray capability.

Tools required (see Figure 3):

- crescent wrench
- diagonal cutter
- locking pliers
- Pipe wrench

Gauge your Coverage
How to Assemble your Own Pressure Gauge Tester
....continued

Figure 2. Parts required for the tester

Here are some tips for assembly:

- Ensure that the tee and elbow line up properly so that the gauges are at the same angle, facing the same way.
- Ensure there is enough room between the two gauges so they clear each other when you thread them into the tester.
- Use a crescent wrench to tighten the gauges – DON'T twist the gauge itself by hand. This is a great way to break them.
- Don't over-tighten the gauges.

To use the tester, thread the questionable gauge into the elbow, and leave the known gauge in the tee. Close the valve and connect the unit to the compressor line. Bring the compressor up to ½ the scale on the gauge. For example, a 200 psi gauge should come under 100 psi pressure for testing. If your compressor cannot get **that** high, set it as high as it can safely go.

Slowly open the valve and see if the gauges are in agreement. If the suspect gauge is 10% more or less than the known gauge, get rid of it. A new gauge costs about $20.00 and is well worth the investment.

Special thanks to Mr. Kip Voege, retired owner of Voege vineyards, for the great idea. Further thanks to Mr. Paul Splinter, University of Guelph, Simcoe Campus, for technical assistance.

For information contact jason.deveau@ontario.ca

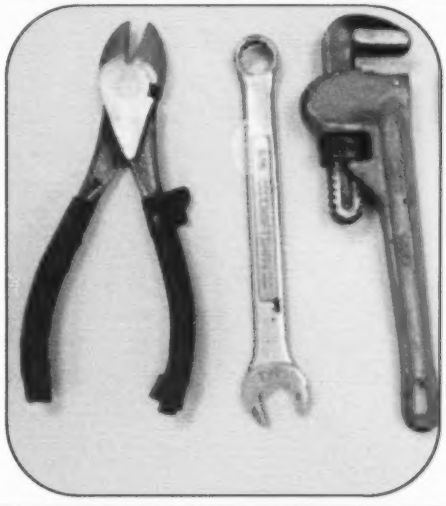

Figure 3. Tools used to assemble the tester

Southwest Crop Diagnostic Days 2012

Thanks to all for another hugely successful Southwest Crop Diagnostic Days!
Hope to See you Next Year!